

## ABSTRACT

The present invention provides a surface acoustic wave sensor for detecting a target substance by measuring the change in frequency due to the mass applied to a reaction membrane placed on a surface acoustic wave element. The surface acoustic wave sensor has high sensitivity due to the improvement of the structure surface acoustic wave element.

The surface acoustic wave sensor 1 uses an SH-type surface acoustic wave and includes a rotated Y-cut  $\text{LiTaO}_3$  substrate having Euler angles  $(0^\circ, 0^\circ \text{ to } 18^\circ, 0^\circ \pm 5^\circ)$  or  $(0^\circ, 58^\circ \text{ to } 180^\circ, 0^\circ \pm 5^\circ)$ ; electrodes 3, principally containing Au, for exciting a surface acoustic wave, the electrodes being arranged on the  $\text{LiTaO}_3$  substrate 2; and a reaction membrane 4, bound to a target substance or a binding substance bound to the target substance, covering the electrodes 3 arranged on the  $\text{LiTaO}_3$  substrate 2. The interdigital transducers 3 have a normalized thickness of 0.8% to 9.5%, the normalized thickness being determined by normalizing the thickness of the interdigital transducers 3 by the wavelength of the surface acoustic wave.